

# Energy Bosnia and Herzegovina

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*Support to promotion of reciprocal understanding of  
relations and dialogue between the  
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## STRUCTURE OF NATIONAL REPORTS

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## STRUCTURE OF NATIONAL REPORTS

### 1. Summary

#### 1.0. Introduction

##### 1.1. Electricity Sector

The electricity sector presents one of the mainstays in the development of Bosnia and Herzegovina. Having in mind export orientation of the sector that the Southeast Europe countries have the considerable problems with electricity shortages, and significant untapped natural resources, Bosnia and Herzegovina's orientation towards the reconstruction and restructuring of the sector is clearly justified.

The reforms of the electric power sector (bringing the law legislation, establishing the institutions for optimal functioning the electric power system, restructuring the electricity monopolies in BiH and privatization) which will ensure sustainability, efficiency and competitiveness of the electric power production in BiH, are implemented within the framework of the Power III Project, which envisages investment of around USD 250 million into the reconstruction of existing power production plants over the coming years.

In Bosnia and Herzegovina, electricity is produced in hydro and thermal power plants. Currently, the production capacities exceed the domestic demand, and the electricity is exported to Croatia, Slovenia and Serbia and Montenegro. With respect to natural resources, Bosnia and Herzegovina has considerable reserves of brown coal and lignite used as a fuel in thermal power plants, and great and untapped hydropower potential.

In Bosnia and Herzegovina, there are three vertically integrated electricity monopolies in charge of the generation, transmission and distribution:

- Elektroprivreda (Electric Power Enterprise) of Bosnia and Herzegovina (EPBiH);
- Elektroprivreda (Electric Power Enterprise) of the Croatian Community Herzeg-Bosnia (EPHZHB); and
- Elektroprivreda (Electric Power Enterprise) of the Republika Srpska (EPRS).

EPBiH has 1,839 MW of installation capacities and with total production in 2003 of 5,362 GWh (thermal power plants participate in amount of 77% and hydro power plants in amount of 23%).

EPHZHB has 762 MW of installation capacities and with total production in 2003 of 1,238 GWh (participation of hydro power plants is 100%).

EPRS has 1,375 MW of installation capacities and with total production in 2003 of 4,657 GWh (thermal power plants participate in amount of 54% and hydro power plants in amount of 46%).

Total power production in BiH in 2003 was 11.26 TWh. Sixty percent of production comes from thermal and 40% from hydro-power plants. The gross consumption realized (distribution, direct and losses) of 10.16 TWh, than the export was 1.1 TWh. The total losses in the transmission and distribution network were 1.9 TWh, which is more than 15% of power

produced. In the year 2003 the collection rate of Electric Power Enterprises was between 75% and 99% and losses in low and high voltage network were 9,8 % (in EPBiH) .

Each electricity company is responsible for the allocation and dispatching of its power plants, and for the control of frequency and voltage in its territory. However, the Common Electricity Coordination Center (ZEKC), jointly owned managed by the three electricity companies, was established in November 1998, to coordinate dispatching and ensure the integrity of the system within. The main function of ZEKCC is to coordinate the management of the power supply system in a safe, effective and efficient manner and to ensure the transmission of electricity to domestic and foreign consumers.

As result of the war destruction the transmission system of BiH is connected on main and second UCTE zone. With construction of 400 kV transmissions line North-South the preconditions for re-synchronization of this two system are realized that is foreseen for 10<sup>th</sup> October 2004. On that way the whole country will be connected into EU Internal Electricity Market.

## 1.2. Gas Sector

All natural gas is imported from the Russian Federation and is transported to Bosnia and Herzegovina via the gas transport systems in Ukraine, Hungary and Srbija.

The main characteristics of the gas system in Bosnia and Herzegovina are – the length of 191 km and the designed annual capacities of 1 billion m<sup>3</sup>. The existing leased transport capacities up to Bosnia and Herzegovina border are, 750 million m<sup>3</sup>/year. In the post-war years, the consumption ranged from 150-200 million m<sup>3</sup>, mostly because of the failure of the war-ravaged industry to recover. For the year 2004 expectations are 350 million m<sup>3</sup>. The pre-war consumption in Bosnia and Herzegovina was approximately 610 million m<sup>3</sup> and was on the rise.

It could be said that, out of the three predominant segments of the energy sector (electric power, liquid fuels and gas sector), the gas sector is the least developed. The existing Bosnia and Herzegovina's gas sector comprises four companies, two in each entity:

In Republika Srpska

- **Gaspromet Pale** (manages the transmission line Karakaj - Zvornik - approximately 20 km)
- **Sarajevogas Lukavica** (transmission line Zvornik - Kladanj and the distribution in the municipality of Srpsko Sarajevo)

In the Federation of Bosnia and Herzegovina

- **BH Gas - Sarajevo** (transmission lines Kladanj - Sarajevo - Zenica, the biggest post-conflict supplier and gas wholesaler in Bosnia and Herzegovina)
- **Sarajevogas - Sarajevo** (gas distribution in Sarajevo)

Although it no longer formally conducts the transport and distribution of gas, the **Energoinvest Sarajevo** needs to be added to the above list of entities that until the outbreak of the war managed the entire gas system in Bosnia and Herzegovina and was the exclusive gas supplier for the territory of Bosnia and Herzegovina. Unsolved debts from the period before and during the war, and the obligations under long-term contracts with Russian

suppliers, this company continues to be a major player in the complicated Bosnia and Herzegovina gas scene.

Current gas consumption is significantly lower than in 1990, again due to the poor conditions in the industrial sector. Due to the unfavourable natural gas consumption (relatively high share of heating and household consumption), the dynamics of consumption are also unfavourable (winter consumption is considerably higher), resulting in increased prices of natural gas. In addition, gas is procured over one pipeline and from one supplier only, which presents a problem in terms of stable supply.

The development of the gas sector will still mostly depend on the developments in the region. Specifically, the plan construction of the “South European Gas Ring” will determine the future of both the gas sector and the entire energy sector in BiH. There is great interest that one line of this ring passed through BiH enabling the development of gas distribution network on the whole area of BiH and the bigger security of system supplying.

## **2. Country Energy Strategy**

The precondition for successful energy sector development is creation by the state a sound energy policy and establishes the institutions to implement such policy. The essential priorities of this policy are:

### **Establish, develop and implement clear, well designed energy policy and appropriate action plans**

- adopt the BiH Energy Development Strategy, in coordination of the BiH Ministry of Foreign Trade and Economic Relations and the competent FBiH and RS ministries, and with cooperation of domestic and international experts,
- to strengthen the Energy Department in BiH Ministry of Foreign Trade and Economic Relations,
- develop the methodology for collection of energy statistics.

### **Encourage energy saving in households and industry**

- to reduce energy consumption, use existing and available technologies such as heat isolation, air recycling, more efficient electric appliances etc.
- as a priority, encourage greater use of public transportation and rationalize use of cars in cities
- increase awareness on savings possible through increased energy efficiency,

### **Reform the energy pricing system**

- Prices must be based on economic criteria and include costs of environmental protection.

### **Encourage application of renewable and alternative energy sources, research and application of new energy technologies and other technologies increasing energy efficiency**

- intensify construction of planned hydro-power plants through concessionary model, and build small hydro-power plants,
- install pilot facilities for utilization of wind solar, geothermal and biomass energy.

In the course are preparation activities on the *Terms of Reference* for Energy Development Strategy for BiH which needed to be realized with support of international financial institutions up to the end of 2005.

The foundations for the reform of the power sector in BiH include the references to the following international documents and national acts

- The Constitution of Bosnia and Herzegovina;
- The Dayton Peace Accord;
- The EU White Paper;
- The European Energy Charter Treaty (ECT);
- The Athens Memorandum 2003
- Energy Community in South East Europe
- EU Directive 2003/54/EC which defined forming joint electricity market and way of electric power sector subject organization;
- EU Directive 2003/55/EC which defined the field of gas sector;
- EU Directive 1999/32/EC; 85/337/EEC; 2001/80/EC in the field of environmental protection;
- The Government of the Federation of Bosnia and Herzegovina/Republika Srpska Electricity Policy Statement;
- The Amendments to The Government of the Federation of Bosnia and Herzegovina/Republika Srpska Electricity Policy Statement;
- The Law on Electricity Transmission, System Regulator and Operator in Bosnia and Herzegovina;
- The Law on Electricity of the Federation of Bosnia and Herzegovina and Republika Srpska;
- The Law on Transmission Company;
- The Law on Independent System Operator;
- The Study "Bosnia and Herzegovina: Electricity Sector Restructuring and Privatization Analysis and Action Plan "
- Action Plans of Government of FBiH/Government of RS
- Middle-term Development Strategy Paper for BiH (PRSP)

Electric Power sector reform process in BiH started some years ago when is made a few sector studies (from the field of electric power, gas, and coal). Among them the most important the study was "Reform process of The Government of the Federation of Bosnia and Herzegovina/Republika Srpska Electricity Policy Statement" prepared by consulting company KEMA from England on the beginning of 2000. On the end of 2001 PA Consulting prepared study "Bosnia and Herzegovina: Electricity Sector Restructuring and Privatization Analysis and Action Plan "which defined the basic principals of electricity sector reforms in BiH;

The major goals of the energy sector reform are:

- stimulate national and international investment;
- ensure a more reliable supply of energy, in accordance with defined quality standards and the lowest prices;
- join the international market through a single market of electric power and gas in BiH;
- enhance cost-effectiveness and rational use of energy sources and improve energy efficiency;
- implement liberalization and introduce competition and transparency;

- ensure protection of environment in accordance with national and international standards;
- protect interests of the system users;
- increase the use of renewable energy sources;
- meet the conditions of the European Energy Charter Agreement, Athens Memorandum related to forming regional energy market, as well as other international contracts and agreements.

By electric power sector model it is necessary to start the reform process in gas sector (preparation the action plans, legislation and regulations, establishing necessary institutions, restructuring) in accordance with BiH obligations result from Athens memorandum 2003 and Energy Community in South East Europe.

### 3. Competitive market structures and rules

When we analyze the reform process of electric power up to now which is in direct relation with fulfilment necessary conditions for creation competition market in BiH it may state that importance results are achieved. There are in bringing law regulation, establishing the system institutions, preparation the action plans, to moving process related to unbundling within the electric power companies and defining the actors of future market.

**The Law on Electricity Transmission, System Regulator and Operator in Bosnia and Herzegovina** came into effect on April 18, 2002 and it presents the initial step in the implementation of the reform objectives in the energy sector. This Law was envisaged to create the conditions for unlimited and free trade and continued electricity supply in line with the specified quality standards. The Law is governed by the general international experiences and relevant EU Directives. The idea behind this Law was to facilitate and accelerate the establishment of the electric power market in Bosnia and Herzegovina, the integration into the regional market, the introduction of a competitive environment and customer protection.

The Law on Electricity Transmission, System Regulator and Operator specifies the institutions of Bosnia and Herzegovina in charge of electricity transmission:

- **State Electricity Regulatory Commission (SERC)**, which has the jurisdiction over and is responsible for electricity transmission, transmission system operations and international electricity trade
- **Independent System Operator (ISO)**, responsible for the management of the transmission network operating and dispatching in Bosnia and Herzegovina and for the governing, maintenance planning and coordination, network construction and expansion in cooperation with the Electricity Transmission Company.
- **Electricity Transmission Company** is responsible for the transmission, maintenance, construction, expansions and the management of the electricity transmission network
- **Ministry of Foreign Trade and Economic Relations** is responsible for policy formulation and for the international policy of Bosnia and Herzegovina in the electricity sector.

With effectiveness of the Law on Electricity Transmission, System Regulator and Operator started the reform process of electricity sector in Bosnia and Herzegovina that envisaged establishing the transparent regulatory framework, liberalization and market opening. The

transmission and distribution will be regulated as would be enable equal access to the networks and with this the competition in production and supply of electricity.

With **Entity laws on electricity** is regulated the issues related to electricity production and distribution, electricity supply and electricity trade, representation and intermediation in the national market.

In accordance with Entity Laws are established **Entity Regulatory Commissions** as specialize, independent and nonprofits organizations responsible for electricity production and electricity distribution.

The **Law on Transmission Company** is effective from August 2004. The objective of the Law is to establish a single transmission company and to ensure a continuous supply of electricity at defined quality standards for the enjoyment of the citizens of Bosnia and Herzegovina. The Law is intended to facilitate the creation of an electric energy market in Bosnia and Herzegovina and its integration into regional energy markets and energy development activities. The Law is based on existing international practices and applicable Directives of the European Union (and their implementation in European Union Member States).

The Company shall perform activities related to the operation of the electric power transmission system in accordance with this Law. Its activities shall include the transmission of electric power and transmission related activities.

The **Law on Independent System Operator** is also effective from August 2004. This Law establishes a non-profit Independent System Operator to direct the operation of the transmission system in Bosnia and Herzegovina, and defines its functions, powers, governance and ownership. The ISO shall perform its activities on the entire territory of Bosnia and Herzegovina.

The objective of this Law is the same as the Law on Transmission Company and is also based on existing international practices and applicable Directives of the European Union.

The activities of the ISO shall include the direction of the operation of the transmission system to ensure reliability, operation of central control centre facilities, operation of the balancing market, provision of system services, the procurement of ancillary services, development and enforcement of reliability standards, development and administration of rules governing use of the transmission system, development and administration of market rules governing the provision of electricity and system services over the transmission system, and other activities specified in this Law. Upon the establishment of the ISO, no other electric or other company or body shall have jurisdiction or authority in these above-described activities.

The ISO is prohibited from engaging in any activity that involves the following activities in any way: generation, supply, trading, or distribution of electric power, or in any other activities not authorized by this Law.

The legal and institutional framework in this sector is still non-existent, which prevents development of gas sector. In 2000, after the preparation of studies on the reform and development of the BiH gas sector, the World Bank offered a draft **Statement of BiH Gas Policy**, which was supposed to serve as the fundamental, common concept of the reform of the gas sector, and, at the same time, the foundation for development of the legislation in the



gas sector, following the previous model in the power sector. Compromise between the entities regarding the offered document was not achieved.

To organize the gas sector along the lines of single and liberalized markets and on the basis of separation of production, transmission, distribution and consumption functions, it is indispensable to introduce a minimum legal framework at the state level, based on the model of modern European energy legislation. This implies passing of a general state-level energy law or at least of a law on transmission, regulatory agency and system operator of gas sector. Then the subsidiary energy laws on the entity level would follow, and these would have to be harmonized in order to hamper creation of a functioning energy market.

- **Designation of independent regulatory authorities:**

Attracting investors is one of the most important preconditions for the successful development of the electricity market in Bosnia and Herzegovina. Transparent processes, politically neutral decision making based on the economical principles and an independent regulatory authorities are the elements that could attract foreign investors and international financial institutions.

In order to ensure reliable transmission capacities, which could meet the electricity market demand, the transmission needs to be strictly controlled and regulated, allowing, at the same time, for uniform operations and connections throughout the country. In order to attract new investments, the bottlenecks in the transmission networks must be eliminated. The establishment of the Regulatory Commissions, the Independent System Operator and a single Transmission Company will help achieve this goal. **The State Electricity Regulatory Commission (SERC)** will be an independent and non-profit institution, which will operate based on objectivity, transparency and equality principles. The scope of SERC authorities includes:

- issuance, changes, suspensions, withdrawals, monitoring and enforcement of transmission and other licenses;
- approving, supervising and imposing tariffs and tariff methodologies for transmission and regulation of supplemental services;
- revision and adoption of market rules and network codes prepared by the Independent System Operator;
- establishment, monitoring and enforcement of rules, based on the fair and indiscriminately network access for the third parties;
- monitoring and fulfilment of the conditions relating to international electricity trade, and especially, ensuring the fulfilment of international technical requirements;
- establishment, monitoring and enforcement of electricity transmission and supplemental services quality standards;
- coordination and approval of the Electricity Transmission Company's investment plans;
- consumer protection ensuring: fair and equal treatment, high-quality service, competition and the prevention of anti-competitive activities, etc.

SERC shall adopt and publish a Code of Ethics governing conflicts of interest and other ethical standards for the Commissioners, employees and staff and other parties. The Code of Ethics shall reflect prevailing international practices.

The following shall fall under the jurisdiction of the **Entity Regulatory Commissions**:

- to supervise and regulate the relations between generation, distribution, and buyers of electric power; including electric power traders;
- to define the methodology and criteria for setting prices of electric power supply to non-eligible buyers;
- to set electric power tariffs for distribution systems users and tariffs for non-eligible buyers;
- to grant or revoke licenses for electric power generation, distribution, supply and trading;
- to grant or revoke licenses for construction of electric power facilities and licenses for using electric power facilities, excluding electric power transmission facilities;
- to define the General Conditions for Electric Power Supply.

In executing its powers and performing its functions the Entity Regulatory Commissions must:

- on the basis established by the State Commission, regulate the electric power market in such a manner as to ensure transparent and fair relations between all participants;
- protect the rights of electric power buyers, electric power distribution companies, and electric power producers; and oversee the relations in the electric power sector;
- create conditions for the establishment of an efficient, reliable and cost-effective system of electric power generation, distribution and supply;
- create conditions for competitiveness in the generation and the supply of electric power;
- create conditions for efficient, cost-effective and safe use of electric power;
- create conditions for the development of the electric power system (generation and distribution)
- regulate the quality of service at all levels, including the tariffs and charges for the monopoly services in distribution, taking into account the electric power supply interests and needs of all users;
- oversee the effectiveness of the mechanisms and processes to ensure a reasonable balance between the demand for and the supply of electric power;
- take care to protect human health and safety and the environment.

The Entity Regulatory Commissions in its work shall cooperate with the State Regulatory Commission and implement its regulations, with the Independent System Operator and the single Transmission Company.

- **Designation of Independent System Operator;**

**Independent System Operator (ISO)** will be a non-profit agency, independent from any individual the market participant and from electricity production, distribution and supply activities. ISO shall not venture into trading with electricity, keeping its independence and authority, and the owners of the Electricity Transmission Company will devolve all relevant responsibilities for the management of the system to ISO. ISO will operate in line with objectivity, transparency and equality principles and will have exclusive control over the coordination of the electricity transmission system.

The main functions of the ISO are as follows:

- maintaining reliability of the system;
- energy flow management;
- provision of supplemental services;
- transmission limits management;

- provision of information on the transmission system;
- coordination with neighbouring regulatory areas;
- coordination of load management.

The ISO shall ensure that technical rules are developed and published, establishing the minimum technical design and operational requirements for the connection to the system of directly connected generating installations, distribution systems, directly connected consumers' equipment, interconnector circuits and direct lines. Such requirements ensure the inter-operability of systems and shall be objective, non-discriminatory and equitable. After the approval of SERC, technical rules shall be published.

The ISO shall adopt a grid code, commercial code and other system operating rules and procedures in consultation with licensees and system users. All such grid codes, commercial codes and system operating rules and procedures shall be submitted to SERC for review and approval.

- **Designation of Distribution Operator;**

A distribution system consists of low and medium voltage electric power facilities (plants and lines) through which electric power is distributed to buyers.

For the purpose of unobstructed functioning of the electric power market, the distribution network must be accessible to all users in an objective, transparent and non-discriminatory manner.

The Regulatory Commission shall define detailed criteria for access to the distribution network.

For the purpose of managing the electric power distribution network, the distribution electric power companies (hereinafter: distributors), pursuant to their needs and taking care to ensure the technical and technological integration in their area of operations, shall within their respective structures found distribution operators

Distributors shall facilitate the transmission of electric power through their networks and the distribution of electric power on their territory at the request of a supplier, implying that distributors shall also operate the distribution network by means of distribution operators, in accordance with the technical capabilities of the network.

Distributors shall be entitled and required to supply system users and buyers with electric power in their respective areas of operation, if so specified in their operation license.

Distributors shall be responsible for development, construction, operation, management and maintenance of the distribution network.

Distributors shall:

- guarantee the reliability of the distribution network operations and the maintenance of quality levels of electric power;
- secure coordinated operation of the distribution network and the transmission network, as well as of the connected networks and user facilities;
- provide information to the Independent Operator on the future demand for electric power,
- secure access to the distribution network for third parties in accordance with the established criteria.

Distributors shall prepare short-term and long-term plans for development and construction of the distribution network.

The Entity Regulatory Commissions, at the proposal of the distributor, approves the plans for development and construction of the distribution network and sets the price of the fee for the use of the distribution network.

The distribution operator shall enable access to the network for all electric power producers and eligible buyers in a non-discriminatory manner, in accordance with the principles of regulated access by third parties. The distribution operator may deny access to the network due to limited technical or operational capacities of the network.

An electric power producer and eligible buyer of electric power that have been denied access to the network must be notified of the reasons for being denied access, which must be objective and non-discriminatory, as well as well-founded and properly substantiated.

Electric power producer and eligible buyer of electric power that have been denied access to the network or are dissatisfied with access conditions may appeal to the entity Regulatory Commission.

The operation and manner of management of a distribution network in the electric power system shall be regulated by the Grid Code.

The Grid Code shall in particular regulate:

- the technical and other requirements for users' connection to the network;
- the technical and other requirements for safe operation of the electric power system in order to provide a reliable supply of quality electric power;
- the actions to be taken during the operation of the electric power system in critical situations,
- the technical and other requirements for interconnections and operations between networks.

The Grid Code shall be drafted by distribution operators, in cooperation with the independent system operator and distributors, and adopted by the Entity Regulatory Commissions.

- **Designation the Transmission Company**

All assets and liabilities necessary for transmission and transmission related activities conducted by the Electric Power Enterprises (EPBiH, EPRS and EPHZHB) shall be conveyed to and become the property of the Company:

This conveyance shall include all assets, liabilities, and ownership rights over the property, including moveable, immovable, tangible and intangible property, financial assets, as well as any other right, title, or interest in or to property, that have been approved by the Management Board of Electric Power Enterprises and permission of the Entity Governments.

Property and assets essential to fulfil distribution activities shall not be included in the assets transferred to the Company. The distribution assets excluded from conveyance shall include all of the low and medium voltage distribution systems with nominal voltages of 35 kV or lower up to, but not including the substations of 110/x kV, which shall be conveyed to the Company.

Property and assets essential to fulfil generation activities shall not be included in the assets transferred to the Company. The generation assets excluded from conveyance shall include all assets involved in electric power generation up to, but not including the transmission lines that connect the generation substation with the transmission system, which transmission lines will be conveyed to the Company.

Property and assets essential for the Independent System Operator ("ISO") to fulfil the responsibilities under its jurisdiction shall not be included in the assets transferred to The Company.

The Company shall be subject to the regulation of SERC. SERC is entitled to inspect the books and records of the Company.

The Company shall conduct its transmission and transmission related activities in full compliance with ISO technical standards, operational planning, dispatch instructions, maintenance schedules and system, expansion plans, as well as SERC regulation, as applicable. These activities shall not include those activities reserved exclusively to the ISO.

- **Definition of technical rules;**

In preparation activities of set of rules for commercial code and market rules for Bosnia and Herzegovina have been included ZEKC and foreign consultants (KEMA Consulting and SEETEC).

KEMA Consulting recommended a number of commercial agreements:

- Connection agreement;
- Use of network agreement;
- Use of system agreement;
- Balancing agreement;
- Framework agreement for each market;
- Ancillary services agreement (optional);
- Metering service agreement (optional);
- Data transfer agreement (optional).

Discussions must be held to determine exactly how many agreements are necessary and their relations with the grid code and market rules. In the initial stage of market opening, metering service and data transfer are most likely to be handled by the ISO and transmission company.

Alternatively, a Framework Agreement could be developed. In this case, potential licenses would have been asked to be a Signatory to the framework agreement as a condition for obtaining the license itself (with the exception of the ISO, DSO and transmission company who are Parties to the rules not participants). The Framework Agreement would include a covenant of the market participant to be bound by, and comply with the market rules. The State Regulator would then know that potential licensees have already agreed to be bound by the market rules and the grid code.

In accordance with the Law on Independent System Operator modify and administer reliability standards, the market rules and grid code are in responsibility of the Independent System Operator that is in obligation to bring them after establishing;

- **Tendering and authorization procedure for building new capacities;**

Entity law for electricity defines procedure regarding the construction of the new capacities. Construction of facilities for generation of electric power for eligible buyers shall be at discretion of electric power companies that have received or shall receive a license to perform the activity of generation of electric power.

The electric power company referred to in paragraph 1 of this Article shall be required to obtain beforehand a license for construction and a license for use issued by the Regulatory Commission.

Construction of facilities for generation of electric power for one's own needs does not require obtaining beforehand a license for construction.

Electric power companies licensed to perform the activity of generation of electric power may build facilities for generation of electric power for non-eligible (tariff) buyers based on a completed bidding process and a license of the Regulatory Commission.

The Regulatory Commission shall issue beforehand a license for construction of facilities for generation of electric power for non-eligible (tariff) buyers to the electric power company that meets the bidding requirements and offers the lowest price for electric power generation.

Construction of facilities and plants for generation and distribution of electric power, except low-voltage connections, shall require the issuance of a license pursuant to the law.

A license for construction of a generation facility shall be granted after the obtaining of a concession from a responsible body, if the construction of such facility requires obtaining a concession right, in accordance with the provisions of a special law.

Any domestic or foreign legal person under conditions set forth in this Law and other laws may also construct facilities and plants for generation and distribution.

Prior to the issuance of the license for construction of electric power facilities and plants for generation and distribution of electric power, the developer must obtain an approval for investment-technical documents in accordance with the law.

A license for use of facilities for electric power generation following their construction shall be issued for a period of 30 years, as of the date of start of generation.

A license for use of facilities for electric power distribution shall be issued for a period of 50 years.

After the expiration of periods, if the license was not renewed or transferred or the facility or structure is used for other purposes, a licensee must, as a rule, dismantle and remove all facilities and reclaim the land.

If a licensee fails to act in accordance mentioned, it must provide funds or guarantees for the resources that will be used to dismantle the facilities, plants, and other structures, and to clear the terrain and reclaim the land.

The amount of funds allocated for the purpose determined by the Regulatory Commission.

- **Transparency of accounts;**

SERC shall, by 1 December of each year, develop a detailed budget for the following year, which shall indicate all the expenses of SERC, including the salaries and benefits of the Commissioners and employees of SERC, as well as the other budgeted expenses of SERC for the next year. SERC shall send the budget to State Parliament for review on 1 December and publish the budget annually.

SERC shall establish a regulatory fee to be paid by license holders designed to cover these estimated SERC expenses. SERC's budget shall be funded by such fees. SERC licensed enterprises shall be entitled to recover such fees in tariffs approved by SERC. SERC's accounts shall be maintained in accordance with international accounting standards and shall be audited annually by an independent auditor.

No later than 31 December, SERC shall submit a written report reviewing its activities for the year to the Parliament of Bosnia and Herzegovina and the Ministry.

The entity Regulatory Commissions shall be funded by the revenues collected from the fees and taxes to be charged from the companies dealing with the mentioned activities and by the revenues from license fees.

The revenues shall be specified in a manner as to cover the expenditure of the Regulatory Commission.

Revenues from the fees and taxes collected by the Regulatory Commission that according to the Regulatory Commission's financial plan are surplus shall be transferred into the revenues for the next year.

The Entity Parliament, at the proposal of the Regulatory Commission, shall adopt the budget of the Regulatory Commission prior to the start of the budget year.

Financial activities of the ISO shall be conducted in accordance with the ISO's Books of Rules, which shall be in accordance with good accounting practices.

The Management Board shall have the ISO's annual financial statements audited by an independent accounting firm within seventy-five (75) days following the end of the ISO's fiscal year.

Within ninety (90) days following the end of the ISO's fiscal year, the ISO shall submit to the Council of Ministers, the Governments of the Federation of Bosnia and Herzegovina and Republika Srpska and SERC, and make available to the public, an annual report on its affairs during that fiscal year, including the annual financial statements audited by the independent international accounting firm.

Financial activities of the Company shall be conducted in accordance with the Company's Books of Rules, which shall be in accordance with good accounting practices.

The Company shall have its annual financial statements audited by an independent accounting firm.

The Management Board shall assure that an independent third party accountant or accounting firm audits the annual financial statements of the Company within one hundred and twenty (120) days following the end of the Company's fiscal year.

- **Third party access to the networks;**

In order for the market to become functional gradually and for the competition to be introduced, electricity suppliers' freedom of choice will be limited to qualified consumers and independent electricity traders, who will be able to purchase electricity directly from the production and trade companies. The qualified consumers will be divided into three categories:

- **Qualified Consumers (QC):** In the beginning, this category will include major industrial consumers, who will have a right to a free selection of their electricity supplier. While the qualified consumers purchase electricity directly from the producers, the role of transmission and distribution will include only the delivery of the purchased electricity;
- **Regional Electricity Traders (RET):** RETs are fully independent trading operations of the distribution companies, who will have a right to purchase electricity from all sources. RET will be able to purchase energy from the production company or to contract other RET or independent traders for delivery.
- **Independent Retail Traders** will be companies with the exclusive function of purchasing electricity and selling it to the qualified consumers and other electricity traders.
- **Market opening.**

In the frame of Project SEETEC is included the support of Canadian Government at establishing the BiH internal electricity market. In continuation are given the general recommendations by the consultant who will be subject of future analyses and discussion.

The market will be established as liberalize market, based on free bilateral physical contract model and equal regulated access to the net. It will be established the balancing market for regulation of surrender from the contract. The customers will can to buy electricity and to choose its supplier.

The new market starts with direct bilateral contracts between sellers and purchasers for approximately the whole demand in the country. These contracts will be concluded on period of four years, and every year after first, will decrease demand, which is cover by such contracts. So, in the next years the purchasers of electricity have to negotiate for the part of its demand-necessity, which will increase every year, than the concluded contracts will cover the most of demand. After four year, purchaser and sellers will have possibility of choice to negotiate about the new contracts and/or to purchase electricity through some pull or balancing market.

The development of electricity market in BiH is stipulated with establishing the regulatory and legally framework and commercially impetus to the sector.

In the frame of liberalization it would be brought the Grid Code that specify the conditions for access of producers to the net so that all producers have the equal access, opening possibility



for competition. System of regulated and published tariff to the access to the net promotes such access on transparent way.

The document related to the most important questions is based on the market creation prepared by company PA Consulting that means bilateral physical contract model with balancing market managed by ISO. The document envisaged 3 to 4 Hydropower Company and 3 to 4 thermal power generator. It is foreseen three public suppliers and for supplying three independent traders, and probably more after market opening. Real time for market opening would be the end of 2005 or beginning of 2006 dependently of time schedule of restructuring process and establishing necessary institutions: Regulatory Commissions, ISO and Transmission Company.

### ***Transmission Constraints***

Before it is rehabilitated, the BiH transmission system is likely to face many transmission constraints. The main issue that arises in the case of transmission constraint is how to competitive electricity market would deal with such constraints. The system will need to maintain stability, and certain actions will have to be taken by the ISO to relieve constraints. The market must deal with how to alleviate such constraints and fairly apply the costs of dealing with constraints.

### ***Rely on balancing market ('counter-trade')***

In Counter trade, the Independent system operator is paying generators to increase or decrease generation. The ISO requests the producers to regulate down a certain amount of generation on the surplus side of the bottleneck, for which they are paid. Similarly, producers on the shortfall side are paid to regulate generation up by the same amount. The costs incurred by the ISO in counter-trading are the cost of purchasing power (upward regulation) less the revenues from the corresponding sales of power (downward regulation). Counter-trading can also be used across national borders. It requires however co-operation between the Independent system operators on both sides of the border.

So, counter-trading leads to increased trade, but not to increased transmission over the bottleneck. In some cases, the ISO will enter into long term agreements for upward and downward regulation by means of counter-trading, which is then applied in the operation phase. The real time market is not affected by this counter-trading.

### ***Transmission Auctions***

An auctions means the ISO is selling the capacity on the interconnection at certain intervals (yearly, monthly, and daily). It is up the market players to utilize the bought capacity for transmission after they have purchased the capacity. The more frequent the explicit auctions, the more dynamic trading become and the more players get access to the capacity.

The particular situation of the BiH transmission system should be carefully assessed but handling internal congestion through the balancing market seems to be a good short-term solution. It might be necessary to regulate some bids and offers, especially hydro-based bids & offers.

### ***Role of hydro and pumped storage***

Hydro generation is of utmost importance in BiH's electricity system, representing more than 50% of installed capacity and 40% of energy production. Specifically, hydro provides peak power and balancing services, which are essential for the running of a stable power system. It

is likely that most balancing energy will come from hydro units. There are also some pump storage units, which should be discussed as well.

Regulation of generation is in the domain of Entity regulators. However, decisions will have to be taken if water value for balancing market purposes should be calculated centrally or left to each generation companies or Entity Regulators to decide. Furthermore, there will be a need for mechanism to make sure that hydro generators are not totally contracted, and thus able to make bids and offers in the balancing market. This should be a market mechanism. i.e. the top-up price needs to be high enough to incentives hydro owners to offer some energy into the balancing market. Alternatively, some hydro energy could be reserved for the balancing market.

There are probably two considerations behind the above reasoning for incentivizing hydro generators against fully contracting:

The first one concerns the need to have enough hydro capacity available in the system, in order for the ISO to be able to balance the system in real time, by dispatching fast ramp-up or down units, such as the hydro.

The second concerns the case where hydro units fully contract in the international market, i.e. they prefer to export rather than make their capacity available for the domestic market. In this case, in addition to the potential non-availability of such flexible units for balancing the domestic market there is an additional threat that domestic energy cost will be high, as supply will be dominated by the more expensive thermal units.

In order to balance the system and maintain voltage and frequency within the appropriate limits, the ISO will utilize any available facility through its ancillary services contracts, i.e. it will also utilize Producers that are also exporting. In effect, hydro units will be available to the system for balancing, at least for up to the secondary reserve level.

Historically, the pumped storage was providing much of the regulation of the BiH system. Given sufficient water inflow, the pumped storage could again play a role in regarding the system.

In the initial stage of the market, the ISO (MO) will operate a balancing market. There will thus be no day-ahead or intra-day adjustment market. However, decisions remain to be taken if there will be a separate congestion management market. and/or separate reserve market for secondary and tertiary controls and/or a separate balancing market. The ISO could also sign ancillary services contracts and pay capacity payment, the energy then being offered in the balancing market and paid accordingly.

### ***Imbalance prices***

If the metered energy volumes are different from schedules of balance responsible parties (BRPs), the BRPS will be deemed in unbalances and shall pay for these imbalances according to the chosen pricing option. The physical balancing of energy is required throughout the day and is procured by the ISO buying and selling energy (and capacity reservation!). If there where no charge made for imbalances, there would be no incentive on participants to contract in order to avoid imbalances. On the other hand, the pricing of energy into the balancing market should be cost reflective in order to ensure that the dispatch of plant is (close to) a least cost despatch. The balancing mechanism comprises the set of rules and actions to implement this balancing market.

***Need for independent suppliers***

The exact role of suppliers will have to be defined in the market rules and approved by the State Regulator.

***Regulation of dominant players***

In most markets, there are various kinds of 'market failure' such the fully competitive conditions are not reached. The key design challenge is how to create competitive market outcomes in the face of dominant players. Almost all commodity markets suffer from the dominant player conditions to varying degrees, and electricity is not exception. In BiH, the problem might be less straightforward than elsewhere given the presence of three utilities and thus at least three future Producers. There are however the challenges of different levels of regulatory authorities. Given the importance of hydro and its potential role in the balancing market, the discussion might focus on hydro.

***Security of supply***

The provision of security of supply is a major issue in the liberalization of electricity markets. Although most new competitive markets have continued to maintain adequate reserve and avoid the 'lights going out', the recent well-publicized problems in California have heightened fears that competition could fail to provide the incentives for new investment.

The inherent risk is that the market may not work under certain circumstances; therefore, the design will need to consider how security of supply will be provided in both the short and the long term.

***Short-term security***

One of the important reasons for maintaining old plants on the system is for them to provide security of supply in the eventually there is an outage of another plant or a surge in demand. Adequate incentives for short-term security therefore depend on providing reserve payments sufficient to keep older plants available.

***Long-term security***

New base-load investment will be brought on when new plants can generate more efficiently (cheaply) than existing plants. Long-term security of supply is provided by new investment. The issue for new investors is how they will have assurances of their revenue sufficient to make their projects 'bankable'.

***What is the supply function?***

Generators can generate at least cost when they produce a constant amount of electricity at each hour of the day and at a level equal to their most efficient operating condition. They also need to schedule maintenance and have unexpected losses of production ('forced outages' or 'trips'). Customers, and therefore their suppliers, have a load shape, which varies at each moment of the day, is usually at a peak on cold weekday evenings and at a trough in the nighttimes, and continues during the maintenance periods and outages of the generator.

The supply function is therefore carried out optimally when the supplier can purchase different amounts of energy (and reserve) from different generators each of whom is able to supply different 'shapes' of electricity at different times of the day/year in a least cost way, including covering for outage times and unexpectedly large peaks or troughs.

### ***Supplier as aggregator***

An efficient supplier is one that creates a portfolio of generation purchase contracts whose aggregate shape and volatility most closely match the aggregate shape and volatility of the portfolio of customer sales contracts. This will also be least-cost for the system (the generators will each be generating at times when they are the least cost plan) and lowest-price for the consumer.

## **3.1 Electricity sector**

### **3.1.1. Existing deficits and obstacles in the implementation processes of EU requirements;**

Development of regional energy market is closely linked with stabilization and association process which started EU 1999 and with signing the stabilization and association agreement signed between EU and every of the countries. Key aspects of process include: political approach, honest, transparent and non-discriminatory access of the third party; establishing the common rules for production, transmission and distribution; in compliance with EU Directives establishment the independent national regulators.

On 2002 EC issued Strategic document which established the conditions for electricity market of South-East Europe. This strategic document and stabilization and association process were the basis for signing Athens MOU on the end of 2002.

The aim of the MOU signing was “establishing integrated regional electricity market of South-East Europe up to 2005 and ensuring its integration in internal electricity market of EU on the principals defined in EU Directives”. According to MOU 2002 and the next MOU 2003, the role of EC include participation as impartial secretariat, in monitoring and supervision of the reforms, aid coordination and preparing annual benchmarking report and implementation program.

Finally, recommendations of EC are that total access to the establishing of regional electricity market need to include: establishing the strong independent national coordinator, coordination of investment policy; tariff reform; and consideration the questions related to environmental protection.

Bosnia and Herzegovina as signor of Memorandum of Understanding undertook the spread of activities in the field of electricity in order of fulfilment aforementioned obligations. As is presented in this document all envisaged activities are in the course:

- All necessary Laws are effective;
- Independent Regulatory Commissions are established;
- Initial activities on establishing Independent System Operator are in the course (in accordance with Law);
- Initial activities on establishing single Transmission Company are in the course (in accordance with Law);
- Activities on restructuring three vertically integrated electricity monopolies are in the course (in accordance with Action plans prepared according to the Study “Bosnia and Herzegovina: Electricity Sector Restructuring and Privatization Analysis and Action Plan “ )
- Activities on Power III Project (reconstruction of electric power system) has implemented according to defined, terms except the SCADA Project

The basic problems in electric power sector related to implementation EU requests are:

- Postponing the reform implementation defined by MOU;
  - complex organization structure of the state and/or complicated system for bringing decision;
  - obstruction of some participants to the reform process implementation;
  - fear of employees for losing the job as consequence of reform;
  - lack of financing for Law implementation – institution work in transition period;
  - lack of staff in the ministries (state and entities);
  - lack of full harmonization of activities within the international community;
  - reflection of political situation in the country on situation in this field;
  - postponing the implementation of SCADA Project

### **3.1.2 Comparison of main issues delivered in the Background and the results from the current analyses. Priorities**

The central issue in sector reform program which could jeopardize the dynamic of fulfilment the obligations of BiH according to EU is unbundling of the three vertical integrated electric power companies into transmission, production and distribution. The transmission system will remain under the authority of BiH (the transmission company will be jointly owned by the two entities), while the production and distribution will be privatized, to attract investments to BiH, ensure better governance and create efficient competition.

The study entitled “BiH: Power sector Restructuring and Privatization Analysis and Action Plan” worked out the sequence, scope and the dynamics of restructuring and privatization of the three ‘elektroprivreda’ by early 2005, formulated a set of recommendations for the restructuring of the energy sector in BiH and defined the privatization strategy, designed to attract major strategic investors. On the basis of this study, the entities prepared and harmonized action plans which include the following phases:

#### **a) Reallocation of assets**

In this phase, the elektroprivredas will separate assets and liabilities of the different sectors – production, distribution, transmission and system management and allocate personnel to new organizations. The transmission company will be formed, and it will receive assets and staff from the elektroprivredas. The Joint Electric Power Coordination Center (ZEKC) will be transformed into the NOS, and the assets and staff will be allocated to NOS by the elektroprivredas. The planned tasks are as follows:

- establish four distinct thermal power plant public corporations;
- restructure coal mines, in parallel with the restructuring of the generating corporations, in order to improve efficiency of the mines make their privatization possible, either with the thermal power plants or separately;
- establish three to four separate hydro power public corporations, organized around a given river system;
- establish the Independent System Operator (ISO) responsible for system planning and dispatching;
- establish the single state transmission company, which will own all high voltage transmission facilities and be responsible for systems maintenance and operation in accordance with the instructions of ISO;
- restructure distribution areas to establish distribution regions to facilitate privatization;
- establish new shareholders companies for power generation and distribution;

- establish a wholesale power market, through contracts between suppliers and traders and in addition through this contractual market, a balance market to be created by ISO;
- establish a market operator for the balance market;
- commercialize newly established production and distribution companies, in order to attract potential strategic investors;
- take part in establishment of the regional electric power market.

#### **b) Corporatization**

- In this phase, production and distribution companies act as separate organizations. New statutes must be written for all new organizations. Accounting and financial standards will be introduced into the new companies. All companies will have identical IT systems for accounting, collection and communications;
- Regulatory commissions will issue temporary licenses for new organizations.
- New tariff methodologies for transmission, ISO, State Regulatory Commission (SERC) and distribution and generation tariffs (entity regulatory commissions) will be introduced.
- ISO will draft initial contracts for auxiliary services with production companies, to define quantities and conditions under which every producer will provide specific auxiliary services.
- During this period Market Rules will enter into force, and the market operator will be established within the ISO.

#### **c) Commercialization**

New production and distribution companies will act as commercial companies, in order to produce positive business reports for presentation to potential strategic investors. They will prepare their plans of cost reduction for the coming years, including reduction of losses and increase of collection rate, prepare financial reports and forms for their investors, check and update investment needs and plans. Commercialization will continue until privatization. Until the time when the companies will be privatized, the elektroprivreda will disappear.

#### **d) Complete the “Power III” reconstruction project**

The project financed by international financial institutions and bilateral creditor and donator includes the following subprojects:

- Reconstruction of high-voltage long-distance power lines;
- Reconstruction of high-voltage transformer stations;
- SCADA/EMS Telecommunication Project;
- Thermal power plants environmental projects;
- Reconstruction of hydro power plants;
- Reconstruction of the distribution networks.

The reconstruction of the 400 kV and 220 kV transmission network, including the 110 kV system facilities, and particularly the reconstruction of the damaged transformer stations, will enable the reconnection and reintegration of the BiH power grid, as well as reconnection with the UCTE, the Balkans and South-eastern Europe system.

The Supervision, Control and Data Acquisition Project (SCADA) will ensure the functioning of the electricity system of BiH, on integrated basis. The implementation of the SCADA Project and the reconstruction of high voltage transmission network will permit the electric power system of BiH to operate as integrated control area in accordance with the UCTE rules, with the UCTE control block encompassing Slovenia, Croatia and BiH. The implementation of these projects should be completed by early 2005.

Mentioned activities are possible successfully to realize with full engagement of all participants which are in process and with full support of international community.

### **3.1.3 Good practices**

Last results achieved in reform process shows that situation in the electric power sector of Bosnia and Herzegovina is significantly improved. They are especially visible in company work:

- Bigger business transparency;
- Increasing the discipline;
- Visible progress in business financing;
- The losses in system are significantly decrease
- The level of collection is significantly increase;
- The level of driving readiness in the plants is increase.

All participants in this process achieved the importance experiences in this field through participation in:

- Preparation of the Law regulation;
- Establishing the independent institutions;
- Preparation the Action Plans for restructuring and privatization;
- Direct contacts with foreign experts and consultants included in this process;
- International conferences related to this matter;
- Membership and participation in the work of international institutions;
- Introduction with successful models which exist in develop countries through study tours;
- Participation on deferent courses and seminars;
- Implementation of the electric power investment projects

Having in mind aforementioned experiences and with additional engagement and understanding of all participants it is real to expect the success in implementation reform process of electric power sector and fulfilment obligations that are accepted with international agreements.

## **3.2 Gas sector**

### **3.2.1 Existing deficits and obstacles in the implementation processes of EU requirements;**

Gas sector reform is just on the beginning so that would be necessary significant international support for speed up the process. The major problems in the gas sector are:

- Non-harmonized entity energy policies – non existence of the gas legislation and regulations;
- Organizational fragmentation between the entities makes the coordination in development of the gas network difficult, increases the consumer price of the gas and is considered one of the factor that deters potential investors;
- one source of supply – one transport route – unreliable supply;
- unbalanced tariff structure that is detrimental to district heating;
- low load factor in gas transport system in BiH, leading to high transport costs;
- high import dependency makes taking the counter-measures more difficult in the case of price increases and thus inhibits the economic development;
- Unfavourable consumption structure, i.e. lower consumption in industrial and higher in the residential sector has created strong seasonal disparity. The seasonal variations need to be smoothed out, because at present they impose the obligation to cover the costs for underused capacities in summer, or to purchase additional quantities in winter.

### **3.2.2 Comparison of main issues delivered in the Background and the results from the current analyses. Priorities**

Regardless of the scenario for its development, the gas sector must be reformed and restructured. The key reform steps in gas sector need to be in accordance with EU Directives for gas and market liberalization that is preconditions for integration into European gas market.

In that sense, the following major reform measures need to be taken in gas sector:

#### **3.2.2.1 Transform legislative and institutional framework**

- adopt the Gas Sector Development Strategy within the BiH Strategy of Energy Sector Development;
- adopt appropriate legislation and regulations, establish an independent system operator and resolve the regulatory functions by establishing one common regulator for energy;
- create an internal gas market,
- introduce a tariff system.

#### **3.2.2.2 Strengthen capacities and improve efficiency of the gas sector**

- build an alternative supply route;
- build underground storages and improve the load factors in the existing gas system,
- diversify the sources of gas supply;
- expand the gas distribution network the include several cities to which gas can cost-effectively supplied through the extensions of the existing system;
- make preparations for attracting strategic partners – prepare the privatization documentation

#### **3.2.2.3 Actively represent BiH interests on the international scene**

- Protect BiH interests in planning the regional energy networks;
- Take part in the establishment of the regional gas market;
- Strive to have one of the legs of the South-European Gas Ring pass through BiH;



### 3.2.3 Good practices

Gas sector is undeveloped sector from the aspect of existing situation as well as from the aspect of regulation. However, BiH as well as all direct participants in this area fully support directives defined in international agreements and are ready to go in reform process.

## 4. Support reforms

- **Tariff reforms necessary to achieve cost reflective prices;**

In Bosnia and Herzegovina, as in other former command economies, energy tariffs were systemically lower than in other parts of the world.

"Energy tariffs must be fair and must promote savings ". This means that the tariffs need to be set at cost return levels and must include also the environmental protection costs, given the negative environmental impact of the energy sector. In specific circumstances, certain temporary consumer subsidy measures may be justified; subsidizing energy sector producers and service providers has negative effects.

SERC has jurisdiction and authority to approve, monitor and enforce tariff methodologies.

The scope shall include:

- (a) Tariffs for transmission, ancillary services and ISO operations shall be regulated and approved by SERC.
- (b) SERC shall issue rules and regulations establishing a tariff methodology that shall incorporate the following principles:
  - (1) Prices shall be just, reasonable, non-discriminatory, based on objective criteria, and determined in a transparent manner;
  - (2) Prices shall be primarily dependent upon the justified costs of operation, maintenance, replacement, construction and reconstruction of facilities, including a reasonable return on investment, amortization and taxes, with consideration of environmental and consumer protection;
  - (3) SERC shall be permitted to establish performance based rates;
  - (4) Interruptible rates, load balancing rates, and other mechanisms to improve energy efficiency and demand side management shall be encouraged, including consideration of the development and dispatch of renewable sources of energy;
  - (5) Season and time-of-use rates are permitted, which prices may be adjustable according to the cost of peak and off-peak services;
  - (6) Cross-subsidies of different customer classes shall be eliminated;
  - (7) Connection fees that are cost justified may be included for connection to the transmission network or substantially increasing load;
  - (8) Regulated third party access principles shall be applied as to electricity transmission networks; and
  - (9) With respect to the tariffs, terms and conditions for the services of the ISO, such tariffs, terms and conditions shall reflect prevailing international practices.
- (c) SERC shall approve tariffs that meet the tariff methodology, in accordance with procedures and criteria set by SERC under its rules and regulations. Such procedures and criteria shall require the company for transmission of electric energy, the ISO and other participants that may be regulated by SERC to prepare and submit to SERC for approval tariff schedules for every class of customer, consistent with SERC's tariff methodology. SERC shall establish for the company for transmission of electric energy the highest rates it may charge for connection to a network or for the transport of electricity.

- **Protection on vulnerable consumers;**

The reform of the electric power sector will have considerably effect on the social conditions in the country. The sector reconstruction process itself should yield considerably positive effects, considering that most project implementation activities will be entrusted to local firms. On the other hand, the construction of the distribution network, especially in the refugee areas, will greatly improve their economic situation, i.e. create most important preconditions for starting small businesses, which is one of the economic policy priorities of BiH.

During the process of company restructuring, which implies separation into the transmission, distribution and production sectors, surplus labour force will be identified. Various modalities for providing for redundant workers should be considered in the early stage of the preparation of these activities. The first solution under consideration is starting small factories for production of electro industry equipment, with own seed capital, and with the support of the international community and the entity funds.

The main problem in this sector will be necessity for decreasing the number of employees (from 14000 to less than 7000)

- **Reduction of non-technical losses;**

Related to previous years the losses in the network are considerable decreased and are between 10 and 20%. As consequence of illegal connection on the network is not possible preciously defined participation of non-technical losses due to missing detail investigation. Estimation is around 20% of total amount of losses.

- **Ecological issues and increase in energy efficiency;**

The thermal generation plants are big polluter. The energy sector is at present the country's main polluter. The energy sector in the Federation BiH has between 65 and 90% of all SO<sub>2</sub> NO<sub>x</sub> and CO<sub>2</sub> emissions to the atmosphere. Before the war, industry, such as the chemical or steel industry, was a major air polluter. Many of these factories are closed, which is why the thermal power generation can be assumed to be biggest air polluter.

Similar data from Republika Srpska were not available, but it is assumed that the situations large same as in the Federation.

A comprehensive modernization and refurbishment programme has been undertaken at a number thermal generation plants with international financing. Some of the improvements brought about are:

- The Tuzla power plant has reduced total dust emissions to 20-25% of its pre-war levels, at unit 3 from 800 to 100 mg/Nm<sup>3</sup> and at unit 4 to around 70 mg/Nm<sup>3</sup>;
- It has also cut the NO<sub>x</sub> emissions from unit 3 to 400 mg/Nm<sup>3</sup> and from unit 4 to some 350 mg/Nm<sup>3</sup>;
- Dust emissions at the Kakanj power plant have fallen to about 150 mg/Nm<sup>3</sup>; and
- Emissions are monitored continuously at the major production units.

Generally, the dust and NO<sub>x</sub> emissions values presented for the rehabilitated units are in line with current EU legislation for large combustion plants (Directive 2001/80/EC). Sulphur emissions have not been tackled so far. The local coal generally has a moderate sulphur content calculated by weight, but total sulphur emissions will nevertheless be substantial as

much fuel is required due to its low calorific value and high ash content. Desulphurization equipment is planned for some generation plants, but funding may not be forthcoming.

Existing hydropower plants have a relatively limited impact on the environment provided that the properly maintained and operated. New hydropower developments may have considerable negative environmental consequences, including diverse effects on biodiversity and tourism.

In order of mitigation the influence on environment, significant effects is possible to achieve with improvement of efficiency, applying the new technologies and using the renewable energy sources.

The main consumers of the final forms of energy are households and the commercial sector (often considered one consumer group), the industry and the transport sector. The share of individual consumer groups varies depending on a number of factors, one of the most important being the climate factor. In the EU countries, with similar average climate conditions, the shares are as follows: the households and the commercial sector account for 40,7 percent, the transport sector for 31 percent and the industry for 28,3 percent.

According to the estimates for 2000, in BiH, the households and the commercial sector accounted for 50 percent, the industry for 25 percent and the transport for 25 percent of the total energy consumption. Therefore, the share of households and the commercial sector in the consumption of energy is the highest. The energy consumed by the households and the commercial sector is used (predominantly) for heating (, water heating and treatment, cooking, illumination and electrical appliances and equipment.

According to some estimates for the EU countries, at least one fifth of the energy consumed by the households and the commercial sector "could be easily saved". Considering that the greatest amount of energy is used for heating, and that the specific energy consumption for heating is considerably higher than in the EU countries, it is obvious that there is a considerable room for restrictions in the energy consumption. In order to reduce the consumption, already developed and available technologies such as temperature insulation, air recirculation, more efficient electrical appliances, etc. should be used. In order to raise the efficiency in the use of available energy, the work on rising the "general energy discipline" and "general energy awareness" of the population is of special significance.

The methodology for designing energy performance indicators in buildings, used in Bosnia and Herzegovina, is mostly outdated and the revision of methodology would assist in both achieving energy savings in the buildings and reducing the investments for energy infrastructure in newly constructed buildings. This could also have an important role in the reconstruction, i.e. restoration of buildings.

In the transport sector, significant changes need to be undertaken with respect to the energy demand, especially taking into account that the primary source of energy used is imported oil, i.e. oil products. For that reason, a possibility of increasing the share of rail transport relative to road transport, which would allow for a greater use of domestic energy sources, should be considered. Identifying the ways to increase the use of public transport and rationalize the use of private vehicles in towns should be the highest priorities.

The possibilities for energy savings in the industry sector are also considerable. Most industries treat energy as tangible cost and calculate the cost of energy in the final price of the

product, which does not contribute to energy savings. The cost of energy should be registered separately, based on the comparison with the cost of energy in the relevant activities in the developed economies, along with undertaking the measures for the rationalization of the consumption. Subsidies could present an effective solution for such measures. Generally, the awareness about the savings that could be achieved with the increased energy consumption efficiency should be raised. Energy savings require investments, but with a short-term investment return period.

- **Security of supply**

Before the war electric power system of BiH was connected with European network as part of unique system of former Yugoslavia. During the war system suffered great destroying and activities on its reconstruction started immediately after signing peace agreement. Up to now are realized the Power I and Power II Projects coordinated by the World Bank and in the course is implementation the Power III Project. With this project is envisaged renewal the remaining part of BiH electric power network after the working readiness would be better than before the war.

Reconstruction of electric power network is strategic objective of BiH because this field is export oriented. As it was before the war and now BiH is exporter of electricity. Taking into account also not used natural resources in hydro energy as well as in coal stock than is clear there is enormous necessity for safe functioning of the system.

In this moment BiH has not technical problem to ensure safe supplying of the electricity to the domestic costumers as well as for export in other countries. In the future, with development of economy, is expected increasing of consumption within the country and in the same time the construction of the new production capacities. With finishing the Power III Project security level of system will considerable increase and/or reconstruction of all vital parts of electric power system as well as finalization of sector reform.

## **5. Investments in the Energy sector**

### **5.1 Privatization processes**

Privatization project of electric power sector of BiH is defined in study "Bosnia and Herzegovina Power Sector Restructuring and Privatization Analysis and Action Plan".

The overall goal of this project is to provide a set of recommendations for the restructuring of the power sector of Bosnia and Herzegovina (BiH) with a view to facilitating a privatization strategy designed to attract significant strategic investors into the sector.

#### **Recommendations**

The principal recommendations made in this report include:

- The electricity industry within BiH should be restructured into the new organizations:
- Customers will include both "Eligible" customers and "Non-Eligible customers. Eligible customers will include only those connected directly to the 110 kV network as well as those consuming in excess of 100 GWh per year. Eligible customers could also include those outside of the BiH. Over time, the threshold for customer eligibility will be relaxed, leading to an increased number of Eligible customers.

- Energy trading will take place on the basis of contracts between generators (or licensed brokers) and retailers. At the outset of the new market arrangements, there will be a set of 'Initial Contracts' put in place covering most of the demand for Non-Eligible customers within BiH. These Initial Contracts will last for four years, and cover a declining amount of energy over time. They will serve to ease the transition between today's market arrangements and the new market arrangements.
- The ISO will create a "Balancing" market to allow surplus and deficit energy to be traded. Initially this will be a simple tariff-based system, but will evolve over time to a fuller bid-based market.
- Needy customers will still receive at least some support for energy costs. The financing for this assistance will come from Entity general taxation revenues and/or earmarked privatization proceeds.
- Strategic Investors will be invited to privatize the new companies.
- The development and implementation of a new regulatory system is of great importance.

### ***Process of Restructuring and Privatization***

- Implementation of the Electricity Laws on State and Entity levels;
- The Entity Regulatory Agencies should work closely with the State Regulatory Commission to coordinate the work on tariffs and the market.
- The Entity Action Plans for restructuring and privatization have to be synchronized. Once this is accomplished, the rules and regulations for the new market must be established, as well as the direct bilateral contracts for the sale and purchase of electricity.
- The State Regulatory Commission will be developing a tariff reform plan to be able to set tariffs for the newly restructured industry, including transmission tariffs and ISO tariffs.
- Advisors should be planned for assistance in technical, legal and financial matters. These advisors will assist in preparing all of the necessary documents that will be required by strategic investors, will assist in devising the detailed strategy for the privatization and for developing the tender, and will coordinate the marketing of the transaction.

### ***Implementation Plan***

The "Implementation Plan" is to proceed with the development of the necessary legal and market infrastructure while simultaneously creating the new companies for the industry.

Implementation Plan of restructuring and privatization request including the next activities:

1. Government Actions and Program Management
2. Legal Development
3. Corporatization
4. Market Infrastructure Development

## 5. Transaction Implementation

### **1. Government Actions and Program Management**

There are three tasks that the governments should take

- The Council of Ministers and Entity Governments should form an inter-ministerial Steering Committee that will be responsible for overseeing the implementation of the restructuring and privatization plan.
- The Governments should be prepared to enact any legislation that is recommended by the Implementation Plan or by the Steering Committee.
- The tariff reform plan

### **2. Legal Development**

In this phase is foreseen the realization of the next tasks

- Enact the Law regulation.
- Established the single transmission company.
- Established the Independent System Operator (ISO).
- Implement the privatization plans by the entities (restructure its organizations).

### **3. Corporatization**

The tasks that are to be undertaken on creating the new companies that will operate in the future industry are as follows:

- An audit of the network assets must be accomplished that will allow separation of assets between the transmission company and the distribution companies.
- Assets and liabilities must be allocated to the new companies.
- Employees must be allocated from the EP's to the new companies.
- Company charters will have to be created for the new companies that reflect the type of company or organization.
- Interim contracts will be developed between the new generating companies and both the new distribution companies and the direct customers.
- All of the new companies that are preparing for privatization must prepare financial statements that will permit prospective buyers to evaluate the future financial capabilities of the companies.
- The new companies should begin operating like commercial enterprises prior to privatization so that they have a positive track record. There are three areas in particular where improvement can be achieved:
  - The new companies should make a concerted effort to reduce their costs of operation.
  - The new distribution companies should begin to reduce losses, so that after a transition period, the combination of technical and commercial losses meets international utility standards.

- The new distribution companies should begin a program to increase collections to bring them up to international utility standards.

#### **4. Market Infrastructure Development**

The tasks that are to be undertaken on the creation of the new ISO, development of the required energy trading rules and the development of the administration systems that will be necessary to serve the market in the future industry are as follows:

- ZEKC should coordinate with the EP's to integrate systems operations personnel, systems and the organization into the new ISO.
- The ISO should develop an initial balancing market for settling after-the-fact contract differences, and enter into any necessary agreements with generators to support it.
- The ISO will draft initial Ancillary Service Contracts with each generating company specifying quantities and terms under which each generating company is to supply specified ancillary services.
- The ISO must create an accounting system that accepts notifications of contractual energy flows from the market participants, and also incorporates real-time metering data in order to determine the resulting contract differences.
- The ISO should develop, obtain approval for and impose an interim ISO tariff that will be in effect during the transition from ZEKC to the ISO but before the vesting of the new companies.
- The ISO and the new Transmission Company should develop a full tariff to be approved by the new State Regulatory Commission once the new market arrangements are in place.
- There are several documents relevant to the ISO that must be developed prior to the start of the new market, such as:
  - A Grid Code
  - The ISO License
  - Metering Codes
  - Transmission Tariff Principles

#### **5. Transaction Implementation**

The tasks to be undertaken to prepare the companies for privatization and to execute the privatization transactions are as follows:

- Hire a Transaction Advisor through a competitive international tender for each package of assets to be sold.
- Summarize the existing information regarding the operation of the sector and of the companies within the sector to create a set of documents by the end of the third quarter for prospective bidders including:
  - Review and status of the regulatory situation in BiH
  - Review and status of all pertinent laws relating to the electricity sector

- Review and status of all laws related to companies, labour, social contracts and other laws that affect foreigners doing business in BiH
- Identify any actions required to make the legal and regulatory framework consistent with successful implementation of privatization
- Design a public information program in coordination with other State and Entity initiatives to inform and educate the public about the reform and privatization of the power sector in BiH
- Prepare detailed operational and financial information and projections for the companies that are to be privatized
- Prepare detailed information and projections for the industry and the market for the services of the companies that are to be privatized
- Prepare an environmental assessment of the existing installations of the companies that are to be privatized
- Prepare the documents to support the sale of the company or assets including:
  - Financial models and projections for each of the companies to be privatized including cash flow analyses that can be used to determine their net present value
  - An engineering-based depreciated cost valuation of the fixed assets of the companies
  - A balance sheet for each of the companies
  - Risk analyses for each of the companies
  - Legal review and statement that all aspects of the transactions are in compliance with the State and Entity legal systems
  - An analysis of the social impact of the transaction
- Design and implement a marketing program for the sale including:
  - Prepare a first presentation to potential strategic investors that discusses the investment climate in BiH
  - Prepare a second presentation to potential investors on the proposed transaction
  - Organize and participate in a Road Show with potential investors on the companies that are to be sold
- When the bids are submitted, review submissions and recommend bidders for pre-qualification.
- Assist in due-diligence for the qualified bidders and arrange for the final evaluations to be accomplished so that transaction closing can occur by:
  - Organizing data rooms with all the necessary information for all pre-qualified bidders to conduct their due-diligence



- Preparing a valuation report for each of the enterprises to be sold
- Preparing all of the bidding documents and contracts and their terms and conditions
- Assisting the State and the Entities in achieving financial closure for each of the transactions

## 5.2. Public Private Partnership

This model of partnership is well known in Europe but in BiH is not realized neither one similar arrangement up to now.

## 5.3. International donors programs

Regarding the international donors programs for BiH it's possible to divide into two groups: aid for electric power system reconstruction and aid for support of sector structural reforms.

**a) *Aid for electric power system reconstruction*** include the next projects:

- The World Bank loan (IDA) for reconstruction of transmission lines 400/220/110 kV;
- European Investment Bank loan (EIB) for reconstruction high voltage switchgear 400/220/110 kV;
- European Bank for Reconstruction and Development Loan (EBRD) for SCADA/EMS and telecommunication Project
- European Bank for Reconstruction and Development Loan (EBRD) for ecological projects for thermo power plants
- Swiss donation (SECO) for reconstruction hydropower plant Jablanica
- Norway donation (NORAD) for reconstruction the distribution components;
- USA donation (USAID) for reconstruction the distribution components;
- Loan of Kingdom Spain for reconstruction the distribution components (in negotiation phase).

**b) *Aid for support of sector structural reforms.***

- European Commission – aid to Elektroprivreda (utilities) in financial management using information technologies, with ensuring the training for senior officials which will apply modern financial management.  
Aid for establishing Transmission Company and Independent System Operator (IPA).
- DFID (KEMA) – aid to ZEKC at establishing Independent System Operator
- USAID – aid at establishing independent Regulatory Commissions (“Pierce Atwood”) and implementation the study of restructuring and privatisation of electric power sector (“PA Consulting”);
- CIDA (Canada) in the frame the project SEETEC assist on establishing single Transmission Company, on strengthening the Department of Energy within the Ministry of Foreign Trade and Economic Relations and establishing the internal energy market.
- Establishing the Independent System Operator – in activities related to establishing and defining the way of functioning are directly included: ZEKC , DFID and EC through consultant company IPA;

- Establishing the single Transmission Company – in defining the legal questions is included company “Pierce Atwood” than for technical and financial question is included SEETEC and EC through consultant IPA.
- Strategy of energy development – the Council of Ministers need to deliver to the World Bank the Terms of Reference as Bank can consider possibility for its financing.

It is possible to state that is achieved important results at using the loan for reconstruction of transmission system, production capacities and distribution. Tendering project procedure is guided in accordance with international financial institution standards enabling participation on bidding all interested companies that fulfilled the tender conditions. Taking into account possibility to offer some projects partially (“lots”) is realized respectable competition on the biddings as resulted with very competitive prices of equipments (for example: high voltage switchgear, transmission lines, SCADA). In this process the key role-played the domestic experts.

The successful results are achieved on the projects financed by foreign donators.

Aid implementation for support to the structural sector reforms is far complicated procedure because in this part is breaking up all problems related to electric power sector reform. With full engagement the domestic participants as well as international community, with late, are accepted the Laws and to move procedure on establishing of system institution. As it mentioned in the document the biggest challenges in this process will be restructuring the electric power companies (unbundling).

Related to the investments in electric power sector it can consider that is one of the most attractive sector in Bosnia and Herzegovina. Significant natural resources, ensured the market, well organized system, renewed electric power network in the most part, successfully started the activities related to sector reform, highly skilled work force with great international experience, very attractive law regulation from the field of foreign investments and concession are guarantee for future foreign and domestic private investors.

Gas sector would be very interesting to the potential investors in the near future after carrying out the reform (for example for development of distribution network). In the next period is expected the expansion of economic activities in BiH that will result with big necessities for energy.

Energy objects have great impact on environment. In objective of its decreasing, the importance effects can be achieved with increasing of efficiency, applying the new technologies and using the renewable energy.

Renewable sources (except hydro energy), on today development level and with today participation in total energy consumption, can be only addition but not substitution existing facilities. However, due to small impact on environment, these technologies develop very fast and their using is growing.

Due to is necessary:

- Intensify the construction of the planed hydropower plants toward one of concession models and stimulate the construction the small hydropower plants;
- Installation the pilot plants for using the wind, solar, geothermal and biomass energy.

*” Support to promotion the reciprocal understanding of relations and  
dialogue between EU and West Balkan ”*

*E n e r g y*

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together in European Union

